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SGE 2023
Symposium de Génie Électrique

LILLE

L2EP
Laboratoire d'électrotechnique et d'électronique de puissance de Lille

Session spéciale N°4

Artificial Intelligence for Energy and Sustainability

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Call for contributions

Providing a reliable and efficient electricity supply is key to ensuring its welfare and sustainable wishes for addressing climate change. For enabling electricity decarbonization, modern power systems are experiencing fundamental transformations in structure and functionality, driven by the use of new technologies such as renewable-based generation, distributed energy resources, advanced sensors, new control systems, etc. These technologies pose numerous operational and planning challenges as variability, uncertainty, heterogeneity of hardware, and complexity, notably linked to the high number of assets. This special session explores proposals, developments, and implementations of Artificial Intelligence (AI)-based solutions to address the aforementioned challenges. We would like to zoom in on research with either a promising AI method or their promising use for energy and sustainability challenges. Environmental impacts of data-driven models and controls are in the scope of this special session.

Topics of interest

- Integration of AI-based adaptive techniques for online power/voltage or other operational controls;
- Software hybridization of AI techniques with conventional techniques approaches for energy management systems;
- AI techniques for knowledge extraction from big energy databases;
- AI-based decision system for holistic and multi-energy systems;
- Intelligent coordination and management of IoT Distributed Generation-Storage-Controllable loads;
- AI techniques for maintenance and fault detection;
- Control of inverter-based generators and microgrids relying on AI;
- AI applications for a resilient, secure, carbon-free electricity supply;
- Long-term planning issues solved with AI-based techniques;
- Shadow help for grid operation in decision support systems and SCADA;
- Energy digitalization challenges and opportunities;
- Environmental impacts of energy digitalization.

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